

Thermally Regenerable Ion Exchange Resins, Phase I

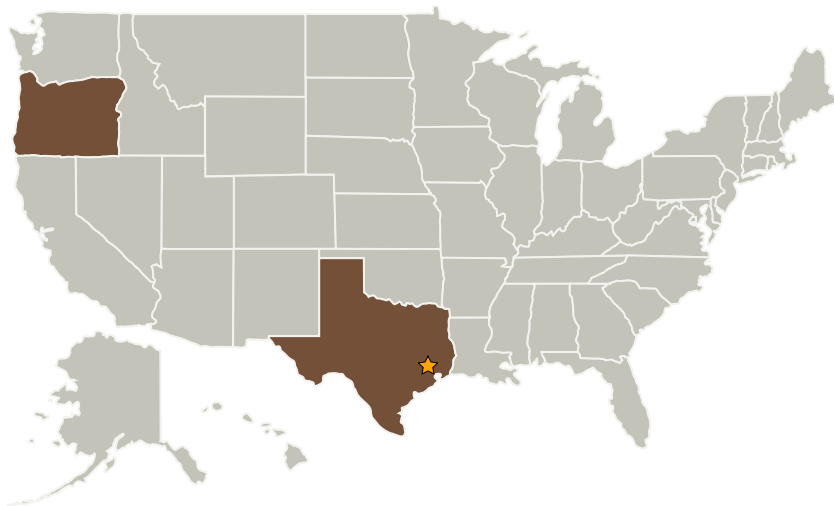
Completed Technology Project (2005 - 2005)



Project Introduction

Future Exploration Initiative missions will require substantial reductions in ESM for water processing hardware. Significant reductions can be achieved using water treatment systems based upon thermally regenerable ion-exchange (TRIX) resins. Ion-exchange (IX) has been the preferred method for removal of aqueous ionic contaminants due to the efficiency of flow-through beds. Attributes of IX systems include ambient temperature and pressure operation, minimal energy use, rapid and efficient contaminant removal, and compared to other purification technologies, failure mechanisms are relatively benign. However, strong acid and alkali are required to regenerate these beds, making regeneration aboard spacecraft impractical. New hybrid TRIX resins developed at UMPQUA RESEARCH COMPANY offer the potential to remove ionic contaminants from water with an acceptable ESM, while retaining the intrinsic advantages of flow-through IX beds. Testing and further development of TRIX is proposed for removal of ionic contaminants from wastewater generated by future transit and early planetary base missions. The primary program objective will be the demonstration of efficient salt removal from different wastewater sources using TRIX resins. Phase I will demonstrate feasibility of water purification based upon TRIX. Phase II will result in development and testing of a fully functional system suitable for further independent testing by NASA.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
UMPQUA Research Company	Supporting Organization	Industry	Myrtle Creek, Oregon

Primary U.S. Work Locations

Oregon	Texas
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

James R Akse

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
 - └ TX06.1.2 Water Recovery and Management